

AL 2.1167-III

GRADE 9 MATHEMATICS
CURRICULUM SPECIFICATIONS
(Program of Studies, 1978)

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Student Evaluation and Records

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GRADE 9 MATHEMATICS CURRICULUM SPECIFICATIONS

The Mathematics Curriculum specifications for Grade 9 were prepared in July 1981 by a committee of classroom teachers, consultants, and Alberta Education personnel under the direction of the Curriculum Branch. Alberta Education acknowledges with appreciation the contributions of the following members of the Grade 9 Mathematics Committee:

B. Stonell, Alberta Education, CHAIRMAN
G. Popowich, Alberta Education
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The following considerations determined the final curriculum specifications for Grade 9.

1. The specifications were based on the *Program of Studies for Junior High Schools, 1978* (amended 1981).
2. Content objectives were used to establish the specifications. Attitudes, interests, and self-concept goals were carefully considered but not included at this time.

CONTENT OBJECTIVES

	Per Cent Emphases*
Number Systems	22
A. Whole Numbers	
- Writes the values for powers (whole number exponents).	1
- Understands and uses the following properties:	3
a) $(a^x)^y = a^{xy}$	
b) $a^{-x} = \frac{1}{a^x}$	
c) $a^0 = 1, a \neq 0$	
- Maintains previously developed skills in problem solving.	1
- Expresses a number as a product of factors (including prime factorization).	1
B. Integers	
- Maintains previously developed skills.	2
- Simplifies expressions involving the order of operations (four arithmetic operations and powers).	1
C. Rationals	
- Maintains previously developed skills.	-
- Writes any number in scientific notation and vice versa.	1
- Recognizes a need for negative rationals.	-
- Writes positive or negative rationals in the lowest terms or higher terms.	-
- Adds, subtracts, multiplies, and divides positive or negative rational numbers.	3
- Changes positive or negative rationals in the form a/b , $b \neq 0$, to decimals.	1

*Where dashes (-) appear in this column, the objective is to receive minor emphasis.

CONTENT OBJECTIVES

	Per Cent Emphases
<ul style="list-style-type: none"> - Changes rational numbers in decimal form to the form a/b. - Solves problems involving positive and/or negative rationals (emphasis on decimals). - Estimates products and quotients to determine if an answer is reasonable. - Estimates square roots of numbers. - Uses tables to determine the square root of a number. 	1 4 2 1 -
Ratios and Proportions	10
<ul style="list-style-type: none"> - Maintains previously developed skills. - Uses ratios to solve problems involving: <ul style="list-style-type: none"> a) percentages b) distance, speed, and time c) profit, interest, commission, tax, discount, premiums. - Uses ratios to construct scale drawings. 	3 5 2
Measurement	6
<ul style="list-style-type: none"> - Maintains previously developed skills. - Calculates surface areas (SI units) of prisms and cylinders using formulas. - Calculates the area of regular polygons. 	4 - 2
Geometry	22
<ul style="list-style-type: none"> - Maintains previously developed skills. - Demonstrates knowledge of the Theorem of Pythagoras through an ability to solve problems. - With compass and straight-edge, constructs triangles congruent to given triangles, using SSS, SAS, and ASA. 	3 4 1

CONTENT OBJECTIVES

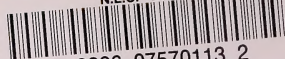
	Per Cent Emphases
<ul style="list-style-type: none"> - Constructs regular polygons. 	1
<ul style="list-style-type: none"> - Uses such terms as <i>edges, faces, lateral face, base, height, and slant height</i> in examining prisms, pyramids, and other polyhedra. 	1
<ul style="list-style-type: none"> - Classifies right prisms and right pyramids, given models of various types. 	2
<ul style="list-style-type: none"> - Constructs models of right prisms, right pyramids, or regular polyhedra as specified by the teacher. 	1
<ul style="list-style-type: none"> - With assistance, develops formulas to measure volume and surface area of right prisms and cylinders. 	3
<ul style="list-style-type: none"> - Given word problems or diagrams and formulas, solves volume and surface area problems. 	6
Graphing	5
<ul style="list-style-type: none"> - Makes graphs from mathematical data and recognizes the dependent variable and the relation constant. (Limit to linear relations.) 	4
<ul style="list-style-type: none"> - Pictures square roots of numbers graphically and reads approximate roots of non-perfect squares from the graph. 	1
Algebra	35
<ul style="list-style-type: none"> - Solves any first-degree equation in one variable with rational coefficients. 	3
<ul style="list-style-type: none"> - Writes word problems for given mathematical statements. 	-
<ul style="list-style-type: none"> - Solves a variety of problems by writing an equation in one variable and solving same. 	2
<ul style="list-style-type: none"> - Knows that letters represent variables. 	-
<ul style="list-style-type: none"> - Knows that formulas represent rules or definitions that express a relation between variables in mathematics and/or science. 	1
<ul style="list-style-type: none"> - Interprets mathematical data and can express it as a relationship. (Limit to linear relations using a non-formal approach.) 	2

CONTENT OBJECTIVES

	Per Cent Emphases
- Applies mathematical principles of variation and formulas to real situations.	2
- Predicts the effect of altering specific elements of a formula.	1
- Solves problems that require the use of a formula.	4
- Identifies specific algebraic terminology: <i>constants</i> , <i>variables</i> , <i>terms</i> , and <i>factors</i> in an expression.	1
- Evaluates expressions by performing the operations in correct order.	1
- Classifies polynomials as monomials, binomials, or trinomials.	1
- States the degree of a polynomial and writes the polynomial in standard form.	1
- Translates English expressions into algebraic expressions.	1
- Identifies the numerical coefficient of a monomial.	1
- Identifies "like" and "unlike" terms and is able to combine like terms.	1
- Finds the sum and difference of polynomials by reordering the elements.	2
- Finds the products and quotients of monomials.	2
- Finds the product of a monomial and a polynomial.	1
- Factors a polynomial by taking out the greatest common factor.	2
- Finds the product of binomials.	3
- Factors trinomials $ax^2 + bx + c$, where $a = 1$.	3
TOTAL	100

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